OVERVIEW OF THE CURRENT REGULATORY PROGRAM OF THE BOARD FOR PROFESSIONAL ENGINEERS AND LAND SURVEYORS

BACKGROUND AND DESCRIPTION OF THE BOARD AND THE REGULATED PROFESSION

History of the Board and Regulation of Engineers and Land Surveyors

The California Legislature created the Board of Registration for Civil Engineers in 1929, following the failure of the Saint Francis Dam in northern Los Angeles County which killed 450 people. The Legislature determined that the unregulated design of construction projects constituted a hazard to the public and thus required the licensing (registration) of civil engineers. The Board's jurisdiction over the licensing of land surveyors was enacted in 1933, when the State Surveyor General's office was abolished. The Board is now officially known as the "Board of Registration for Professional Engineers and Land Surveyors." As of January 1, 1999, the name of the Board will change to the "Board for Professional Engineers and Land Surveyors."

The Professional Engineers Act (PE Act) has had some major changes over the years since the Board's creation. The number of branches of engineering which the Board regulates has increased, and the status of some of the older branches has changed. For instance, when electrical and mechanical engineering were first covered by the registration law in 1947, the law only affected the use of "titles" of those branches (only those registered as electrical or mechanical engineers could call themselves electrical or mechanical engineers, but anyone could work in those areas). In 1967, the statutes were amended to regulate the "practice" of mechanical and electrical engineering, thus making them "practice acts," which means that a person who isn't registered as an electrical or mechanical engineer cannot practice in those areas, unless he or she is working for an exempted employer.

Not all engineers who practice in California have to be licensed. There are a number of licensing exemptions for engineers who are employees of licensed engineers or who work for industrial corporations, public utilities or the federal government. In last year's legislative session (Chapter 705, Statutes of 1997), the industrial exemption was broadened to include temporary employees, contract employees, and those hired through third-party contracts. Of the approximately 2.2 million practicing engineers in the United States, only about 18% are required to be, or choose to be, licensed. Some licensing specialties have higher registration rates, such as civil engineers with 44%, while others are lower, such as chemical engineers with only 8% being licensed.

The statutes were amended in 1968 and further amended in 1971, to delegate to the Board the right to regulate the titles of additional branches of engineering. Between 1972 and 1975, the Board expanded the registration program by adding nine title branches of engineering. In 1986, the Board requested a statutory change eliminating its authority to create new categories.

Currently, professional engineers are registered through three (3) "Practice Act" categories of civil, electrical, and mechanical engineering, and through thirteen (13) "Title Act " categories of agricultural, chemical, control system, corrosion, fire protection, industrial, manufacturing, metallurgical, nuclear, petroleum, quality, safety, and traffic engineering. As of January 1, 1999, three "title acts" will be eliminated. They include: "corrosion," "quality," and "safety" engineer.

There are also two specialized "Title Authorities" for those already registered as a civil engineer: structural and geotechnical (soils) engineer. In addition to the engineering branch titles already listed, titles also restricted to registered engineers are "consulting engineer," "professional engineer," and "registered engineer." As of January 1, 1999, "licensed engineer" will also be added to the list of restricted titles.

There is only one category of licensure for land surveyors. They are regulated under the Professional Land Surveyors Act (PLS Act). Restricted titles for land surveyors are "licensed land surveyor," "professional land surveyor," "land surveyor," or any combination thereof.

Certification, and the right to use the titles, is also provided to those designated as an "Engineer-In-Training" (EIT) or a "Land-Surveyor-In-Training" (LSIT). An EIT or LSIT will be certified after completing the qualifying experience and passing the required exam. The examinations, which test a person's knowledge of the fundamentals of engineering and surveying, are usually taken and passed prior to applying for registration as a professional engineer or land surveyor.

Board Composition

The Board is presently composed of 13 members: 7 public members, 5 licensed engineers, and 1 licensed land surveyor. Eleven members of the Board are appointed by the Governor, while one public member is appointed by the Assembly Speaker and one appointed by the Senate Rules Committee.

Licensing Data

As of August 2, 1998, the Board directly licenses and/or regulates over 127,400 professional engineers and land surveyors. This figure does not include EIT/LSIT certificates, but does include 27,442 cancelled, 8,159 delinquent, 1,880 "retired," 54 revoked, 11 surrendered and 2 suspended licenses. Table 1 on the next page provides a breakdown of licensing data for all Board-registered engineers over the past four years.

Table 1 - Licensing Data

LICENSING DATA	FY 1994/95	FY 1995/96	FY 1996/97	FY 1997/98
Registered Licensees (Type)*	**Total: 90,015**	**Total: 89,995**	**Total: 91,045**	**Total: 90,205**
Civil	39,642	40,799	41,510	41,869
Geotechnical	1,106	1,147	1,259	1,168
Structural	3,017	3,070	3,029	3,101
Electrical	7,969	8,106	8,351	8,324
Mechanical	15,793	15,048	15,249	15,373
Land Surveyor	3,780	3,776	3,704	3,809
Title Acts				
Agricultural	352	354	341	309
Chemical	2,220	2,275	2,306	2,116
Control System	2,963	2,931	2,902	2,686
Corrosion	623	631	632	516
Fire Protection	920	944	957	868
Industrial	1,175	1,176	1,179	1,174
Manufacturing	2,126	1,942	1,915	1,825
Metallurgical	694	574	581	577
Nuclear	1,348	1,302	1,283	1,081
Petroleum	616	533	534	543
Quality	2,682	2,455	2,407	2,221
Safety	1,647	1,557	1,526	1,298
Traffic	1,342	1,335	1,380	1,347
****Applications For Exams**	Total: **17,117**	Total: **15,100**	Total: **14,360**	Total: **12,246**
Professional Engineer	8,750	7,434	7,744	5,786
Land Surveyor	571	691	557	530
Structural	361	371	384	343
Geotechnical	85	103	77	96
EIT/LSIT	7,350	6,501	5,598	5,491
*****Licenses Issued (Type)**	Total: **6,748**	Total: **5,434**	Total: **5,945**	Total: **4,907**
Civil	1,857	1,422	1,807	1,292
Geotechnical	32	42	30	32
Structural	110	56	80	106
Electrical	425	211	294	281
Mechanical	458	461	295	456
Land Surveyor	116	60	106	124
Agricultural	2	2	3	2
Chemical	93	75	40	63
Control Systems	12	18	10	14
Corrosion (eliminated 1/1/99)	7	6	7	3
Fire Protection	29	26	23	19
Industrial	5	8	1	5
Manufacturing	4	2	1	1
Metallurgical	0	5	1	7
Nuclear	3	0	3	0
Petroleum	3	1	4	13
Quality (eliminated 1/1/99)	3	2	3	2
Safety (eliminated 1/1/99)	0	7	5	4
Traffic	73	27	58	46
EIT Certificate	3,390	2,868	2,296	2,331
LSIT Certificate	126	135	176	97
Renewals Issued	**Total: 19,334**	**Total: 24,875**	**Total: 24,273**	**Total: 21,974**

* Numbers from Teale Status Code Report, July 1st statistics for respective years.

** Numbers from actual cashiering statistics.

*** Numbers from manual license-issued log.

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BUDGET AND STAFF

Table 2 - Fee Schedule

Fee Schedule	Current Fee	Statutory Limit
Application/Exam Fee		
Professional	$175	$175
In-Training	$60	$60
Renewal Fee (Every 4 years)	$160	not more than application fee
Delinquency Fees	$80	not more than 50% of renewal fee in effect on date of reinstatement
Exam Appeal Fee	$135	$135 - set by regulation, not statute
Duplicate Certificate Fee	$10	$10 - set by regulation, not statute

Table 3 - Revenues and Expenditures*

REVENUES	ACTUAL				PROJECTED	
	FY 94-95	FY 95-96	FY 96-97	FY 97-98	FY 98-99	FY 99-00
App Exam/License Fees	2,174,875	1,973,664	1,788,557	1,599,921	1,412,847	1,336,080
Renewal Fees	3,166,095	3,606,133	3,457,335	4,215,429	3,354,640	3,354,720
Delinquency Fees	56,510	62,410	55,845	53,468	54,657	54,062
Duplicate License/Cert	3,500	3,720	3,510	4,960	3,920	4,028
Fines (Citations)	-	-	500	350	-	-
Other Misc. Income	21,267	22,237	18,559	11,629	10,346	10,346
Interest	217,818	202,813	210,459	225,270	174,886	188,951
Legal Fees: Reimbursement	-	-	936,974	-	2,944,252	882,909
TOTAL REVENUE	5,640,065	5,870,977	6,471,739	6,111,027	7,955,548	5,831,096
TOTAL REIMBURSEMENTS	21,696	39,453	53,453	34,335	-	-
TOTAL RECEIPTS	$ 5,661,761	$ 5,910,430	$ 6,525,192	$ 6,145,362	$ 7,955,548	$ 5,831,096

* Figures based upon Calstars Month 13 reports.

EXPENDITURES	FY 94-95	FY 95-96	FY 96-97	FY 97-98	PROJECTED	
					FY 98-99	FY 98-99
Personnel Services	1,944,692	2,308,690	2,226,095	2,302,850	2,226,481	2,263,698
Operating Expenses	3,746,120	3,732,195	4,202,648	4,053,375	5,471,837	4,526,298
TOTAL OE & E AND PS	5,690,812	6,040,885	6,428,743	6,356,225	7,698,318	6,789,996
(-) Reimbursements	<21,696>	<39,543>	<53,453>	<34,335>	-	-
(-) Distributed Costs:						
Central Admin ProRata	<187,630>	<176,700>	<133,279>	<67,901>	<131,824>	<170,582>
DCA ProRata	<674,503>	<675,939>	<713,122>	<685,072>	<859,810>	<902,921>
TOTALS	4,806,983	5,148,703	5,528,889	5,568,917	6,706,684	5,716,493

Table 4 - Expenditures by Program Component

EXPENDITURES BY PROGRAM COMPONENT	FY 94-95	FY 95-96	FY 96-97	FY 97-98**	Average % Spent by Program
Examinations	2,560,865	3,400,428	3,535,808	3,877,296	**52%**
Enforcement	2,674,682	1,871,782	2,442,923	2,097,555	**39%**
Licensing	455,265	768,675	450,012	381,374	**9%**
TOTALS	5,690,812	6,040,885	6,428,743	6,356,225	

Table 5 - Analysis of Fund Condition

ANALYSIS OF FUND CONDITION	Actual		FY 98-99 (Budget Yr)	FY 99-00 (Projected)	FY 00-01 (Projected)	FY 01-02 (Projected)
	FY 96-97	FY 97-98				
Beginning Reserve, July 1	2,816,176	3,100,673	3,122,969	3,370,199	2,401,299	905,584
Prior Year Adjustments	188,827	239,529				
Total Adjusted Reserves	3,005,003	3,340,202	3,122,969	3,370,199	2,401,299	905,584
Revenue						
License Fees*	5,324,305	5,885,757	4,836,410	4,759,236	4,902,013	6,000,000
Reimbursements	53,454	34,335				
Interest**	210,459	225,270	174,886	188,951	134,473	50,713
Legal Fee Reimbursement	936,974		2,944,252	882,909		
AB 969, Chap. 59, 1997			(10,000)	(10,000)	(10,000)	(10,000)
Total Rev. & Transfers	6,525,192	6,145,362	7,945,548	5,821,096	5,026,486	6,040,713
Total Resources	9,530,195	9,485,564	11,068,517	9,191,295	7,427,785	6,946,297
Expenditures						
Budget Expenditure***	6,428,743	6,356,225	6,918,000	6,461,000	6,461,000	6,461,000
Y2K (Year 2000 Upgrades)		754	560,818	53,937	1,106	
Integrated Consumer Protection System			125,000	219,000		
SB 492 (Internet Info.)			84,000	42,059	46,095	
Personal Responsibility Act			10,500	14,000	14,000	14,000
Board of Control Claim		5,616				
Late Chg. - State Controller	779					
Total Expenditures	6,429,522	6,362,595	7,698,318	6,789,996	6,522,201	6,475,000
Reserve, June 30	3,100,673	3,122,969	3,370,199	2,401,299	905,584	471,297
MONTHS IN RESERVE	5.8	4.9	5.3	4.2	1.7	0.9

* Fluctuations occur because renewals are on four-year cycle.
** Interest earned at 5.60%
*** Budget Increase by 0%

LICENSURE REQUIREMENTS

Education, Experience and Examination Requirements

To become licensed as an engineer or land surveyor in California, a candidate must typically complete two written examinations; an engineer-in-training or land surveyor-in-training (EIT or LSIT) examination and another as it pertains to their specialty. The candidate must also provide evidence of at least six years of education and/or work experience. (All other states require at least eight years of combined experience.) However, not all licensees have been required to take an examination. With the adoption of each title act, practice act, and practice authority, registrants were grandfathered. Almost three-quarters of the current registrants in some disciplines were grandfathered.

Exams administered to engineers and land surveyors are either provided by the National Council of Examiners for Engineering and Surveying (NCEES) or developed by the Board. The Board develops land surveyor, traffic, geotechnical, structural and special civil examinations. As of January 1, 1999, the Board will administer examinations for the 18 disciplines in which the Board offers licensing, registration, or certification. (Note: As of January 1, 1999, three examinations were eliminated: safety, corrosion, and quality.)

The Board defines qualifying engineering work experience as "that experience satisfactory to the Board which has been gained while performing engineering tasks under the direction of a person legally qualified to practice in the applicant's branch of engineering." The experience requirements for a land surveyor must be gained under the "immediate direction and supervision" of a person qualified to practice land surveying.

The applicant must submit with the application for licensure a summary of all work experience, along with satisfactory references by those who employed the candidate (called the "Engagement Record and Reference Form"). All applicants must submit completed reference forms from at least four persons legally authorized to work in their specific discipline and who have personal knowledge of the applicant's qualifying experience.

There are some restrictions on the use of qualifying experience, including: (1) a candidate cannot count work performed prior to obtaining his or her engineering degree as qualifying experience, (2) overlapping work done in other areas (or disciplines) cannot be counted, and (3) the experience used to qualify for a previously issued license cannot be used to qualify for a license in another discipline.

The following outlines the various licensing requirements for the disciplines regulated by the Board:

Engineer/Land Surveyor-In-Training. The EIT and LSIT exams are typically taken before applying for licensure as a professional engineer or land surveyor. Each is an eight-hour NCEES exam offered twice a year which is used to test the fundamentals of engineering or land surveying. The applicant for the EIT exam must usually have completed three years of college or university education in a program approved by the Accreditation Board for Engineering and Technology (ABET) or three or more years of Board-approved experience. There are no educational or experience requirements to take the LSIT.

Applicants for licensure in one of the disciplines can waive the EIT or LSIT exam. However, the experience requirements to waive the EIT/LSIT exam are 14 to 17 years of qualifying experience, depending on the type of education the candidate has prior to applying for the examination. (A temporary regulation allows a candidate with a doctoral degree in engineering to waive the EIT requirement. The regulation, which expires in February, 2000, was adopted to encourage engineering professors to register.) A candidate waiving the EIT/LSIT can count work prior to obtaining his or her degree as qualifying experience.

Civil Engineer. A candidate for a civil engineer's license must meet all of the above requirements, have a total of six years of qualifying experience (four of which will be granted for an ABET-accredited BS degree; two years for a non-accredited BS degree), pass the eight-hour NCEES exam for civil engineering which is offered twice a year, and since 1988, also pass the California Seismic Principles and Engineering Surveying exams developed by the Board and administered twice a year. The candidate must also complete and pass the take-home test on California engineering laws and Board rules.

Structural and Geotechnical. To qualify for the title authorities of structural or geotechnical engineer, all of the requirements for a civil engineer must be met, and the appropriate exam developed by the Board must be passed. (The structural exam is 16 hours, while the geotechnical exam is 8 hours.) Also, additional qualifying experience is required. The candidate for structural engineer must have three additional years of "responsible charge" experience in structural design work and must submit three references from structural engineers to verify this. ("Responsible charge" is defined in Section 6703 of the B&P Code and means the independent control and direction, by the use of initiative, skill, and independent judgment, of the investigation or design of professional engineering work or the direct engineering control of such projects. The Board further defines this term in Rule 404.1 of its regulations.)

The candidate for geotechnical engineer must have four years of "responsible charge" experience in soil engineering projects and submit four references from civil engineers, two of whom are actively engaged in the practice of "soil engineering."

Other Professional Engineering Disciplines. The requirements for the other engineering disciplines are similar to those for a civil engineers except candidates are not required to take the Seismic Principles and Engineering Surveying exams. Some of the exams are provided by NCEES, while others are developed by the Board. All are eight-hour exams.

Land Surveyor. If a candidate for a land surveyor's license holds a LSIT certificate, they must have a total of six years of qualifying experience before they can take the exam. Four years will be granted for graduation from an approved program. The two years remaining work experience must include one year of responsible field training and one year of responsible office training. Candidates who do not graduate from an accredited program can still receive one year of credit for each year of post-secondary education as long as it is approved by the Board. Until January 1, 2000, the Board may grant two years experience for passing the LSIT exam. SB 2239 (Chapter 878, Statutes of 1998) deleted the discretionary credit for the LSIT exam after that date. A registered civil engineer only needs two years of experience in land surveying to take the exam. After January 1, 1999, all experience must be "broad based."

The Board does not use the national land surveyor exam but instead has developed its own exam. It is an eight-hour exam administered once a year. Land surveyors must also pass a take-home examination on the Board's rules and regulations.

Time Frame for Registration by the Board

Unlike Boards with on-going testing, this Board administers civil, chemical, electrical, and mechanical engineering exams as well as EIT and LSIT exams twice a year. Land surveying, agricultural, control system, corrosion, fire protection, geotechnical, industrial, manufacturing, metallurgical, nuclear, petroleum, quality, safety, structural, and traffic exams are administered once a year. The time from final filing date of applications to examination is consistent from year to year. The time from an examination date to issuance of license is also consistent from year to year. The length of time depends upon the examination grading process, but is not less than 3 months or more than 4 months.

AVERAGE DAYS TO RECEIVE LICENSE/ CERTIFICATE	EIT/LSIT	PE/PLS
Application to Examination:	60	105
Examination to Issuance:	91 - 122	
Total Average Days:	151 - 182	196 - 227

Continuing Education/Competency Requirements

There is no requirement that engineers or land surveyors participate in continuing education as a condition for license renewal, nor does the Board currently plan to adopt any such program. The Board may require as a condition of probation remedial education, including ethics courses, for engineers or land surveyors found to be guilty of violating the PE or PLS Acts.

Comity/Reciprocity With Other States

An engineer registered in another state may apply for California registration by comity. Comity applicants must take and pass (70% minimum score) the California Laws and Board Rules examination, a 25-question multiple-choice examination which is completed at home and returned to the Board office for scoring. California accepts the NCEES eight-hour examinations for the practice act branches of civil, electrical, and mechanical engineering and the title act branches except traffic, for which there is no NCEES examination. Civil engineering applicants must also pass the California Seismic Principles and Engineering Surveying (special civil) exam. If the home state has waived the EIT exam, the application is evaluated to see if the home state's waiver matches California's waiver requirements. If not, the applicant must either pass the EIT or have 15 - 17 years of experience.

Additional Requirements for Registration by Comity Summarized

Discipline	Board Laws and Rules (25-item take-home exam)	Seismic Principles and Engineering Surveying	California Exam (No NCEES equivalent)
Civil	**X**	**X**	
Electrical	**X**		
Mechanical	**X**		
Agriculture	**X**		
Chemical	**X**		
Control Systems	**X**		
Fire Protection	**X**		
Industrial	**X**		
Manufacturing	**X**		
Metallurgical	**X**		
Nuclear	**X**		
Petroleum	**X**		
Traffic	**X**		**X**
Geotechnical	**X**		**X**
Structural	**X**		**X**

ENFORCEMENT ACTIVITY

ENFORCEMENT DATA	FY 1994/95	FY 1995/96	FY 1996/97	FY 1997/98
Inquiries	Total: **12,224**	Total: **12,263**	Total: **24,397***	Total: **16,381***
Complaints Opened (by Source)	Total: **243**	Total: **279**	Total: **325**	Total: **245**
Public (consumer)	108	159	99	92
Licensees	18	12	30	23
Other (gov't agency, Board)	117	118	196	130
Complaints Opened (By Type) **				
Unlicensed Activity	46	83	49	36
Competence/Negligence	79	124	143	155
Contractual	22	18	2	7
Fraud	26	19	7	7
Other	3	3	1	6
Record of Survey	14	25	155	71
Examination Subversion	66	43	29	35
Complaints Closed	Total: **232**	Total: **271**	Total: **330**	Total: **223**
Complaints Pending	Total: **125**	Total: **133**	Total: **123**	Total: **142**
Complaints Submitted to the Division of Investigation (DOI) (subset of Complaints Pending)	Total: **37**	Total: **30**	Total: **23**	Total: **20**
Compliance Actions	Total: **10**	Total: **35**	Total: **30**	Total: **25**
Final Citation – Order of Abatement	N/A***	3	3	6
Final Citation – Order to Pay Fine	N/A***	0	1	2
Cease & Desist/Warning	8	29	23	15
Mediated	2	3	3	2
Referred for Criminal Action ****	Total: **5**	Total: **13**	Total: **11**	Total: **5**
Referred to AG's Office *****	20	24	23	22
Accusations Filed	21	23	22	19
Accusations Withdrawn after Filing	0	2	1	2
Accusations Dismissed	1	1	1	1
Stipulated Settlements	Total: **9**	Total: **15**	Total: **10**	Total: **8**
Disciplinary Actions	Total: **19**	Total: **23**	Total: **18**	Total: **16**
Probation	15	14	11	9
License Suspension Only	0	2	0	2
License Revocation/Surrender	4	5	7	5
Other ******	0	2	0	0

The total number of "Disciplinary Actions" are those in which either license revocation, suspension or probation occurred.

* Inquiries: FY 96/97 total does not include information from 10/96 and 11/96 due to a computer malfunction; FY 97/98 total does not include 8/97 through 1/98 due to a computer malfunction.

** Complaints can be opened under more than one "type"; therefore, adding up the various types under "Complaints Opened (By Type)" will result in an erroneous "total."

*** The Board received the authority to issue citations in FY 95/96.

**** "Referred for Criminal Action" indicates those complaints submitted to the District Attorney's Office for the filing of criminal charges; it does not indicate whether or not the District Attorney actually filed charges.

***** "Referred to AG's Office" includes the number of cases submitted to the AG's Office for either the filing of an Accusation or a Petition to Revoke Probation; the term "Accusations" as used in this section also includes Petitions to Revoke Probation.

****** In two separate cases, the Board accepted the surrender of the Civil Engineer registration which authorized the practice of land surveying and issued a new Civil Engineer registration which did not authorize the practice of land surveying.

Enforcement Program Overview

NUMBER OF COMPLAINTS OPENED, COMPLAINTS CLOSED, COMPLAINTS PENDING, COMPLAINTS REFERRED TO THE DIVISION OF INVESTIGATION, ACCUSATIONS FILED, AND DISCIPLINARY ACTIONS TAKEN				
	FY 1994/95	**FY 1995/96**	**FY 1996/97**	**FY 1997/98**
Complaints Opened	243	279	325	245
Complaints Closed	232	271	330	223
Complaints Pending	125	133	123	142
Complaints Submitted to the Division of Investigation (subset of Complaints Pending)	37	30	23	20
Accusations Filed	21	23	22	19
Disciplinary Actions	19	23	18	16

Note: It is rare that a complaint will be opened, submitted to DOI, closed, have an accusation filed, and have disciplinary action taken all in the same fiscal year.

Case Aging Data

AGING OF PENDING COMPLAINT INVESTIGATION CASES (includes time at DOI and expert, if applicable)				
NUMBER OF PENDING CASES BY AGE	**FY 1994/95**	**FY 1995/96**	**FY 1996/97**	**FY 1997/98**
1-30 days	17	19	20	14
31-60 days	21	16	17	12
61-90 days	19	27	28	24
91-120 days	11	17	6	14
121-180 days	11	10	10	16
181-270 days	22	18	21	42
271-365 days	14	24	11	13
Over 365 days	10	2	10	7
TOTAL NUMBER OF PENDING CASES	**125**	**133**	**123**	**142**
PERCENTAGE OVER 180 DAYS	**37%**	**33%**	**34%**	**44%**
PERCENTAGE OVER 365 DAYS	**8%**	**2%**	**8%**	**5%**

AVERAGE AGE OF PENDING COMPLAINT INVESTIGATION CASES (includes time at DOI and expert, if applicable)				
	FY 1994/95	**FY 1995/96**	**FY 1996/97**	**FY 1997/98**
AVERAGE AGE OF PENDING CASES IN DAYS	**145**	**139**	**140**	**167**

AGING OF CASES AT THE ATTORNEY GENERAL'S OFFICE								
	FY 1994/95		FY 1995/96		FY 1996/97		FY 1997/98	
Pre/Post Accusation Filing *	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**	**Pre**	**Post**
0-91 days	4	5	5	7	7	5	3	7
92-182 days	4	6	6	1	3	7	1	3
183-274 days	2	2	3	4	0	1	5	1
275-365 days	0	5	0	1	0	5	2	3
1-2 years	4	7	1	2	1	0	1	4
2-3 years	0	1	1	2	0	1	0	0
Over 3 years	3	2	0	0	0	1	0	0

* Pre-Accusation is calculated based on the date the case is submitted to the AG's Office to June 30 (the end of the fiscal year). Post-Accusation is calculated from the date the Accusation is filed to June 30 (the end of the fiscal year).

Citations and Fines

CITATIONS AND FINES	FY 1994/95	FY 1995/96	FY 1996/97	FY 1997/98
Final Citations – Order of Abatement	N/A	3	3	6
Final Citations – Order to Pay Fine	N/A	0	1	2
Amount Assessed	N/A	N/A	$500.00	$350.00
Reduced, Withdrawn, Dismissed	N/A	0	0	1
Amount Collected	N/A	N/A	$500.00	$350.00

The Board received the authority to issue citations in FY 95/96.

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Results of Complainant Survey

The JLSRC directed all boards and committees under review this year to conduct a consumer satisfaction survey to determine the public's views on certain case handling parameters. (The Department of Consumer Affairs currently performs a similar review for all of its bureaus.) Since 1993, the Board has sent a Complaint Survey to the complainant when a complaint has been closed, along with a self-addressed, prepaid postage envelope. Since January 1993 the Board has sent 826 surveys and received 125 responses. When surveys are returned with questions or negative comments, the complainant is contacted to clarify concerns and/or answer any questions.

EXISTING (1993 - 1998) CONSUMER SATISFACTION SURVEY RESULTS		
QUESTIONS	**RESPONSES**	
# Surveys Mailed: 826 **# Surveys Returned: 125**	**Yes**	**No**
1. Was our representative courteous?	97%	3%
2. Did our representative understand your problem?	85%	15%
3. Were you kept advised of the status of your complaint?	87%	13%
4. Were the reasons for case closure explained to you in a clear and concise manner?	86%	14%
5. Were you satisfied with the results?	63%	37%
6. Even if the matter was not resolved in your favor, do you feel that your case was dealt with in a fair and reasonable manner?	81%	19%

The following are samples of the comments, both negative and positive, received on the Complaint Surveys:

"I was very impressed by the professional handling of this matter by staff. Without assistance this matter would probably not have gotten resolved. I owe a deep gratitude for your assistance."

"In response to 'Was our representative courteous?' The representative would call and leave a message for me to call her back. She would never wait, she would call back – way too soon. I could see if it had been a few more days, but the same day – No No!"

"Thanks for all your help. Your attention finally forced the insurance co. to settle our claim. Thanks so much!"

"I thought that practicing without a license would be dealt with much more severely."

"I feel the case was closed because [the subject] retained the services of an attorney"

Board staff is currently updating and amending the survey questions and changing to a 5-point grading scale. The following are some of the proposed changes to the survey questions:

- Were you satisfied with knowing where to file a complaint and whom to contact?

- Were all your questions regarding the complaint process answered in an understandable manner?
- Were you satisfied with the final outcome of your complaint? If not, why not?
- Was the matter resolved as you had hoped?
- Were your telephone calls returned in a timely manner?
- Do you have any suggestions or comments that would improve our service to consumers?

ENFORCEMENT EXPENDITURES AND COST RECOVERY

Enforcement Expenditures

EXPENDITURE CATEGORY	FY 1994/95	FY 1995/96	FY 1996/97	FY 1997/98
Attorney General	$236,739	$278,894	$220,702	$283,375
Office of Administrative Hearings	38,889	67,807	24,776	66,595
Evidence/Witness Fees	61,383	108,878	87,413	90,308
Division of Investigation (DOI) – Investigative Services *	259,986	58,997	3,406	15,121
TOTAL	**$596,997**	**$514,576**	**$336,297**	**$455,399**

* DOI is budgeted and billed as pro-rata. The total year-end expenditures equal the total budgeted amount. For example, if we over-expend the budgeted amount in one year, the budgeted amount in the next year is increased to cover the previous year's expenditures.

Cost Recovery Efforts

COST RECOVERY DATA	FY 1994/95	FY 1995/96	FY 1996/97	FY 1997/98
Potential Decisions *	20	24	19	16
Decisions Ordering Costs *	11	13	11	10
Amount Requested **	$69,645	$63,147	$75,630	$58,377
Amount Ordered **	$51,703	$46,935	$59,249	$34,069
Amount Collected * **	**$25,563**	**$28,938**	**$9,419**	**$665**

* "Potential Decisions" are those decisions issued by the Board in administrative disciplinary matters in which cost recovery was requested initially. Cost recovery is not ordered in Default Decisions or when the Accusation is dismissed. Additionally, the Board usually waives recovery of its costs when accepting the voluntary surrender of the license. For example, in 96/97 there were five defaults, one dismissal, and two voluntary surrenders. Cost recovery was not ordered in these cases.

** The difference between amount requested and amount ordered is the amount not ordered by the Administrative Law Judges (ALJs). In ordering recovery of the Board's costs in a Proposed Decision, the ALJs determine the "reasonable" amount of the costs. There are no guidelines to follow in determining what constitutes "reasonable"; therefore, the ALJs vary widely on what is considered "reasonable."

*** If reimbursement of the Board's investigative and enforcement costs is ordered as a condition of probation, the subject is given a period of time in which to pay or is allowed to make payments. However, if the subject fails to pay in the time required, it is considered a violation of the probationary order. If the Board orders the probation terminated, all of the conditions including the order to pay reimbursement are also terminated. In some cases, rather than terminate the probationary order, the Board will allow the subject additional time to pay. Additionally, if reimbursement is ordered in a decision which orders the revocation of the subject's license, the reimbursement must only be paid if the license is reinstated. The difference between the amount ordered and the amount collected can be explained as follows:

FY 94/95: $3,350, failed to pay, probation terminated
$20,000, must pay if reinstated
$2,790, allowed to make payments

FY 95/96: $4,000, failed to pay, probation terminated
$5,208, must pay if reinstated
$8,790, failed to pay in time required, re-ordered to pay in FY 97/98

FY 96/97 $49,825, allowed to make payments

FY 97/98 $5,944, must pay if reinstated
$28,126, allowed to make payments

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RESTITUTION TO CONSUMERS

RESTITUTION DATA	FY 1994/95	FY 1995/96	FY 1996/97	FY 1997/98
Amount Ordered	$6,011	$22,936	$11,175	$45,936
Amount Collected *	$6,011	0	$5,000	$25,000

* Restitution may be ordered as a condition of probation. The subject is given a period of time in which to pay or even allowed to make payments. However, if the subject fails to pay the restitution in the time required, it is considered a violation of the probationary order. If the Board orders the probation terminated, all of the conditions including the order to pay restitution are also terminated. In some cases, rather than terminate the probationary order, the Board will allow the subject additional time to pay. Explanations for the difference between the amount ordered and the amount collected follow:

FY 95/96: $4,500, failed to pay, probation terminated
$18,436, failed to pay in time required, re-ordered to pay in FY 97/98
FY 96/97 $6,175, allowed to make payments
FY 97/98 $2,500, failed to pay, probation terminated
$18,436, allowed to make payments

COMPLAINT DISCLOSURE POLICY

It is the policy of the Board to provide information to the public regarding complaints and disciplinary actions resulting from violations of the Professional Engineers Act, the Professional Land Surveyors' Act, and the Regulations of the Board. The Board keeps records of complaints for five years. The Board discloses the following information upon request after the completion of an investigation: the number of complaints against the individual; the date the complaint was received; and the disposition of the complaint, such as compliance obtained, mediated/resolved, referred for formal legal and/or disciplinary action, or any other action taken against the subject. If the complaint is still in the investigation stage or if the investigation reveals that there was no violation of the law, no information is disclosed. The Board keeps records of formal disciplinary actions (citations and accusations) and discloses the information as required by law. The information provided includes the action taken, the reasons for the action, and the date of the action. If the matter is final, information regarding compliance with the order is also provided. If the citation or decision on the accusation is not yet final, its procedural status is provided. The Board also publicizes its disciplinary actions by issuing press releases, publishing articles in the Board's newsletter, posting the information on the Board's internet site, and providing information to other states' regulatory boards.

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CONSUMER OUTREACH AND EDUCATION

Consumer education is the most cost-effective form of consumer protection. The Board has established many successful ways to provide consumers with necessary information. In December 1994, the Board published the free publication, *"Consumer Guide to Professional Engineering and Professional Land Surveying."* It is distributed to libraries, to city and county building departments, and at public outreach meetings and is also available on the Board's web site. Our highest priority is immediate dissemination of information following floods, earthquakes or other disasters, when many consumers need the services of an engineer or land surveyor. For example, the consumer guide was distributed at "flood forums" held following this year's flooding in Northern and Southern California.

In July 1995, the Board's Enforcement Unit began an outreach educational program that has been very successful. Board members and staff meet with local public agencies and various professional societies and associations to discuss issues including unlicensed activity and violations of the practice acts. These meetings have resulted in cities and counties filing more complaints against negligent engineers and land surveyors.

Also in 1995, the Board began sending its newsletter, which includes summaries of all disciplinary actions taken by the Board, to all licensees in order to further educate them regarding violations of the law. The newsletter had previously been sent only to California public agencies and anyone who requested it.

The Board now has a web site (http://www.dca.ca.gov/pels). The complete text of the *Consumer Guide* is available there, as well as a consumer complaint form. The web site contains the Board-maintained regulations (Title 16, California Code of Regulations sections 400 - 474.5) and has links to the PE Act and the PLS Act on the Legislative Counsel's web site. License look-up capability should be available no later than June 1999 and accounts of all disciplinary actions taken in the past five years will also be available before the end of this fiscal year.

In 1998, the Board published a *Guide to Engineering and Land Surveying for City and County Officials* to help county surveyors, city engineers, public works officials, and city and county building departments quickly look up what engineers and land surveyors can legally do and what constitutes unlicensed practice. This guide will not only help the officials do their job, it will enable them to pass on correct information to California's consumers.

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BOARD RESPONSE TO IDENTIFIED ISSUES AND RECOMMENDATIONS OF THE JOINT LEGISLATIVE SUNSET REVIEW COMMITTEE

ISSUE #1. Should the Joint Committee support a complete revision of the Professional Engineers' Act ("PE Act Rewrite") as proposed by the Board?

Recommendation: ***The Joint Committee has been unable to fully assess the ramifications of the "PE Act Rewrite" as proposed by the Board, and as such, has no position at this time. The Board must demonstrate how the Rewrite will improve the existing regulatory situation for consumers. To the extent the Rewrite moves away from title acts, if the title protections cannot demonstrate how it protects the public from harm, the Joint Committee is supportive of sunsetting the titles.***

Additional Comments and Questions from JLSRC: The Joint Committee, the Legislature, and the Administration were unwilling to delegate to the Board absolute authority to eliminate title acts and create practice acts as originally proposed in AB 969. This is generally the prerogative of the Legislature and the Governor. However, if there are other changes which were contained in AB 969 which the Board still believes are necessary to protect the public safety, then they should be brought to the attention of the Joint Committee. Each statutory change proposed should be fully explained, as well as how the change from current law would impact the engineering profession. One of the reasons for the failure of AB 969 as originally proposed was a lack of understanding and confusion about what the Board was trying to accomplish by rewriting the entire Professional Engineers Act.

Board Response:

In 1997, after many hours of discussion, informational forums, and meetings, the Board of Registration for Professional Engineers and Land Surveyors (Board) introduced Assembly Bill 969 (Cardenas). It updated the way engineers are registered, clarified the Professional Engineers Act (B&P Code sections 6700 to

6799), and arranged the information in a more orderly fashion. Because of the complex issues and the amount of information in the bill, AB 969 became a two-year bill.

When AB 969 was scheduled for its first policy committee hearing, the committee and the author requested that the Board reduce the bill in scope to address only the most important issue. Although the Board believed all of the proposed revisions of the PE Act were necessary, it determined that the issue needing immediate attention was deregulation of the title acts. The bill was amended to address one of the recommendations of the JLSRC — the issue of unnecessary title act regulations in the engineering profession. The first step to updating and clarifying the PE Act, therefore, became elimination of the title act branches of corrosion, quality, safety, and traffic engineering.

The main reason for discontinuing these branches was that few states, if any, recognize these branches. Furthermore, there are no national examinations for those titles, nor are there any accredited degree programs in those branches at any universities; there are a small number of candidates for examination in these titles; and there are no enforcement cases involving practice in these branches of engineering. Given these factors and the costs of developing and administering the examinations and the opinions of the entities that hire such engineers, it is apparent that deregulating these branches of engineering would not endanger the health, safety, property, or well-being of California consumers.

When AB 969 was heard in the Assembly Consumer Protection, Governmental Efficiency & Economic Development Committee, the Committee decided that California's densely populated cities, complex transportation systems, varying terrain and seismic instability make regulation of traffic engineering important to California consumers. The bill was amended to continue regulation of the traffic engineering title. AB 969 passed both houses and was signed by the governor. As chaptered in July, it will eliminate the restriction on the use of the corrosion, quality, and safety titles as of January 1, 1999.

Currently registered corrosion, quality, and safety engineers will still be able to use those titles. The last examination for the three was administered in October, 1998. Only engineers registered in the branches will be entitled to use the titles of "consulting __ engineer," "registered __ engineer," "licensed __ engineer," or "professional __ engineer" in conjunctions with corrosion, quality, or safety. Other professional engineers who are registered in other branches of engineering still will not be able to use those terms, because they have not been registered (licensed) by the Board in any of those three engineering branches. Anyone, professional engineer or otherwise, will be able to use the simpler terms of "corrosion engineer," "quality engineer," or "safety engineer," on or after January 1, 1999, as long as they do not add the term(s) "consulting," "registered," "licensed," or "professional."

The Board is committed to continuing a licensing program that appropriately safeguards the life, health, property and public welfare of Californians. We believe that regulation of engineering practice is necessary and effective in protecting the public safety and that eliminating three California-specific title act examinations is a good beginning towards clarification and simplification of the regulatory process.

The Board still believes in many issues that it sought to address in the PE Rewrite. Some of these issues should also be addressed in the Professional Land Surveyors Act as they are not engineering-specific issues, but rather issues that affect the consumers and practitioners of both professional engineering and land surveying. The following is intended to advise the committee of those issues should it decide to incorporate any or all of them into legislation:

- Modify the expiration date of Board member terms from June 1 to June 30 in order to be consistent with the State fiscal year calendar.
- Authorize the Board to adopt, by regulation, a Code of Professional Conduct in order to better serve the professionals and protect the consumer (LS Act also).
- Authorize the Board to implement a retired/inactive license status (LS Act also).
- Allow the Board to examine other engineers in addition to civil engineers on seismic requirements in order to better safeguard the consumer.
- Allow the Board to rescind a license or certificate if it was issued in error (LS Act also).
- Clarify and further define the Board's authority to take action against a licensee or unlicensed individual in order to better serve the consumers, the public, and the licensees (LS Act also).

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ISSUE #2. Should the State continue to regulate the practice of Civil, Electrical, and Mechanical Engineering and Land Surveying, and the fifteen(15) title act disciplines of engineering?

Recommendation: ***The State should continue regulating the practice of civil, electrical, mechanical engineering and land surveying. However, other areas of engineering regulated by the Board should be limited to areas in which there is a clear potential for harm to the consumer. The concept of "Title Acts" of engineering should be reevaluated. If it cannot be demonstrated that the practice as encompassed by the title, if performed unregulated, poses the risk of health, safety, or financial harm to the public, then that practice should be unregulated. If unregulated, the title restriction should be abolished. Recommend that the Joint Committee, the Department, and the Board work together to determine what areas of engineering should be regulated and how title acts should be eliminated.***

Additional Comments and Questions from JLSRC: Although the Board was not granted legislative authority to make determinations about which title acts should be eliminated or converted to practice acts, the Board has always had the authority to evaluate whether specific title acts are necessary and make recommendations to the Legislature and the Department. The Board took the first step in accomplishing this through the passage of AB 969, which eliminated the title act branches of corrosion, quality, and safety engineering. The Board also conducted two meetings to allow affected engineers an opportunity to respond to this original proposal. At the outset, elimination of the title act for traffic engineers was also considered, but agreement was reached that deregulation of this branch could endanger the safety of the public on our highways, and local cities and county transportation agencies required registration. The Board should now make recommendations to the Joint Committee on what other title acts could potentially be eliminated without endangering the health, safety, property, or welfare of the public. The Board should clearly demonstrate why the title act should be continued.

The Board should consider such things as: (1) how many of the engineers within the particular title act branch have had to meet the examination requirement (or were instead grandfathered when the title act was adopted); (2) the number tested within the branch each year; (3) how many other engineers possibly work within this discipline and are not registered with the Board; (4) the number of other states which regulate engineers in the designated branch; (5) who generally hires this type of engineer and has oversight of their work (employment by government, exempt industries, or in private practice); (6) whether the engineer is in responsible charge and using independent judgment on engineering projects, or is generally

supervised or required to have the work approved (stamped and signed) by others; (7) who are the consumers of these engineering services and are they sophisticated enough to choose a qualified engineer in this branch; (8) if there is evidence of actual or potential damage to the public and if an individual consumer would be directly or indirectly affected by the incompetent or negligent work of the engineer; (9) whether instances of damage or harm to the public would have occurred anyway even though registration exists (e.g., problems more directly related to some other aspect of engineering or to an exempt area); (10) if local government, state or federal agencies require registration in the branch to perform the particular engineering services; (11) if there are other local, state, or federal agencies which regulate or have oversight of the engineering services provided by the registered engineer; (12) the extent to which the engineering branch overlaps with others and whether the engineer could be assigned to another regulated branch based on prior experience?

Board Response:

The Board is currently working with the Joint Legislative Sunset Review Committee, the Department of Consumer Affairs and various engineering professions to determine what title acts should be regulated and how. The chart on the following two pages summarizes the information requested in the twelve questions above, and further discussion of the issue follows the chart.

NOTE TO READERS OF ON-LINE VERSION: Please open the file **Charts29-30.pdf** to view or print the chart which is printed on pages 29 and 30 in the bound publication of this report.

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The Board, the DCA, and the JLSRC all agree that the practices of civil, electrical, and mechanical engineering and land surveying should continue. This issue has not changed since the initial Sunset review. The structural and geotechnical engineering licenses are title authorities, not title acts. They are granted to civil engineers who have demonstrated to the Board their qualifications to use the titles by extended experience and mastery examination. The Board does not plan to make changes to the structural or geotechnical title authorities.

History of title act registration in California

The Board of Registration for Civil Engineers was created in 1929 due to the failure of the Saint Francis Dam (Chapter 766, Statutes of 1929). A law was then enacted requiring the registration of civil engineers. When Committee hearings of the bill were held, a difference of opinion developed between proponents of registration by branch and those who favored registration in the category of professional engineer only. Opposition also developed from those engineers who were against the philosophy of licensing in general. The mining engineers strongly objected to any regulation of their activities as did some representatives of the mechanical and electrical engineering groups. Because the principle opposition came from groups who practiced in branches other than civil engineering, the bill was amended to exclude them and require registration of civil engineers only. It was in this form that Assembly Bill 174 was signed by the Governor (Chapter 801, Statutes of 1929). Initially the area of overlap between architecture and engineering was considered relatively unimportant, but as taller and taller buildings were being created it became a source of increasing controversy. To resolve the disputed area of overlap between architecture and structural engineering, a solution was offered creating the title authority of structural engineer. Registered civil engineers who were found to be qualified in structural engineering could use the title structural engineer. Civil engineers sponsored legislation creating the structural engineer title authority (Chapter 254, Statutes of 1931). In 1933, the Board's jurisdiction was expanded to include the licensing of land surveyors.

It appears that the technical advances made during the forties, possibly due to World War II , resulted in the registration, by title, of engineers in the branches of chemical, electrical, mechanical, and petroleum engineering. This was done through legislation in 1947. For the next twenty years there were many influences of varying importance which contributed to the rapid advancement of engineering. The more noteworthy of these influences included the Korean War, the struggle for missile supremacy, and the race for exploration and control of space. Because of the more specialized use of electrical and mechanical engineering, the law was amended in 1967 to change electrical and mechanical engineering from title act registrations to practice act registrations. Also in 1967, the legislature created the title disciplines of metallurgical and industrial engineering – which the Board opposed. A bill was then passed by the Legislature (Chapter 895, Statutes of 1968) which gave the authority to create new title acts to the Board. That bill also contained a

provision that required any group of engineers applying for registration with the Board to first have in place an accredited college program in their respective branch of engineering. This would make it very difficult for any new groups to apply for registration.

Several years passed and the composition of the Board changed. In 1971 legislation was passed repealing the provision relating to the requirement that a discipline be covered by an accredited program. This legislation had the effect of removing a major road-block to the various disciplines seeking to apply to the Board for recognition and various groups petitioned the Board for registration. In the early seventies the Board received petitions from persons representing the branches of aerospace, agriculture, air pollution, communication, control system, corrosion, environmental, fire protection, manufacturing, nuclear, quality, safety, and traffic engineering. Hearings were held and all petitions were approved except for the petitions of air pollution, aerospace, communication, and environmental engineers. In 1976 and 1977 the Board was finally able to adopt formal regulations to implement the engineering disciplines which it had recognized over the proceeding years.

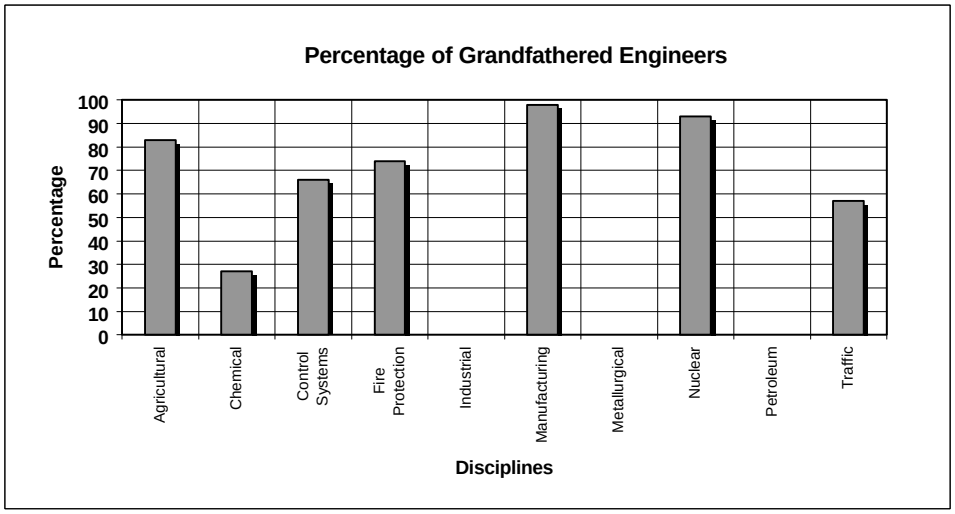
In 1982 the title authority of geotechnical engineer was added to the practice of civil engineering by the Legislature (Chapter 646, Statutes of 1982).

In 1985 Senate Bill 1030 (Chapter 732, Statutes of 1985) was passed by the Legislature with support by this Board. The bill amended Section 6732 of the B&P Code to codify the existing engineering disciplines into the Professional Engineers Act, thereby recognizing them by statute rather than by Board Rule. It also repealed Section 6700.1 of the B&P Code which allowed for the establishment of new engineering disciplines by petition to the Board.[*]

As of January 1, 1999, examinations in three title acts (corrosion, quality, and safety) have been eliminated. There are 10 remaining title acts in question: agricultural, chemical, control systems, fire protection, industrial, manufacturing, metallurgical, nuclear, petroleum and traffic engineering. The question remains how the public is protected by granting engineers a license which regulates the use of the title but not the practice. That is, anyone, registered or not, can legally practice any title-act discipline as long as it doesn't fall within non-exempted civil, mechanical or electrical engineering practice. Furthermore, if there is an enforcement case against a title-act engineer, the Board can revoke the title-act license, but the individual can still practice in that discipline, just as anyone not licensed can practice in a title-act discipline. Unlicensed people are only prohibited from using the title.

[*] Historical background based in part upon "A Brief History of Engineering Registration," prepared in 1962 by Board staff member Vincent R. Fisher.

Several of the remaining title acts were enacted with grandfather provisions, which allowed practitioners to submit evidence of experience in the field in order to be registered without examination. Six disciplines have a percentage of currently-registered grandfathered engineers greater than 50%: agricultural (83%), control systems (66%), fire protection (75%), manufacturing (98%), nuclear (93%), and traffic (57%). That is to say, the majority of the engineers in the given discipline were not examined when the Board created that title act. More currently-registered chemical engineers took and passed the examination than were grandfathered (27%). The three other title acts, industrial, metallurgical, and petroleum did not have grandfather clauses.



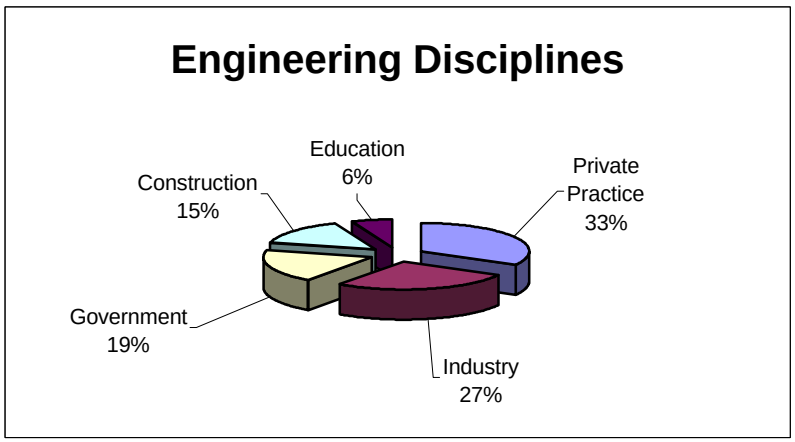
The vast majority of engineers licensed in title-act disciplines are employed by exempt industries. There are licensing exemptions for engineers who work for industrial corporations, public utilities, or the federal government. In 1997's legislative session (Chapter 705, Statutes of 1997), the industrial exemption was broadened to include temporary employees, contract employees, and those hired through third-party contracts. These engineers, while in responsible charge[*], do not have liability for work performed. The liability is carried by the industry or corporate employer.

Very few title-act engineers consult to the general public. However, a significant number of fire protection and traffic engineers consult either on their own or in a design-engineering firm. Sometimes local government or state agencies require a stamp from a fire protection engineer on fire protection designs or from a traffic engineer on traffic studies or designs. Often, those agencies do not know the difference between practice act and title act disciplines. Fire protection and traffic

[*] Responsible charge is the independent control and direction, by the use of initiative, skill, and independent judgment, of the investigation or design of professional engineering work.

engineering work does not require a stamp since an individual does not have to be registered to do the work. The Board is currently informing city, county, and state agencies about our laws through the enforcement unit's outreach program. It is important that local and state government agencies understand the distinction between the practice acts and the title acts.

The number of non-registered engineers in the 10 title act disciplines is difficult to estimate since any person can do the work, they simply cannot use the title of the discipline unless they are registered. Statistics from the California Society of Professional Engineers, which has approximately 3,000 members from all engineering disciplines, indicate the following distribution of engineers: private practice 33%, industry 27%, government 19%, construction 15%, and education 6%; however, this does not include any breakdown between the practice acts and the title acts.



As discussed in the response to Issue # 1, corrosion, quality, and safety engineering will no longer be examined after January 1, 1999. The disciplines were eliminated based in part upon the justification that there was no national exam available, thus California was spending resources to develop an examination and register engineering titles not recognized by other states. In addition, there were very few individuals being tested each year, and it was determined that eliminating them would not harm public safety.

Many of these same factors have been considered in determining a recommendation as to whether the Board should continue to regulate the remaining 10 title acts. While the Board believes that title act registration provides minimal public protection, at hearings the Board held to consider the elimination of these title acts there has been a great deal of opposition. The Board uses national examinations for qualifying individuals for registration in the remaining titles, except traffic engineering. According to survey results from the National Council of Examiners for Engineering and Surveying (NCEES), 43 to 50 states, depending upon the

discipline, use the NCEES examinations. This would indicate that they are recognizing the disciplines in some way.

Elimination of a title act would affect comity with other states and the ability of out-of-state engineers to become registered by comity. Currently, there are branches of engineering registered in other states that California does not recognize. The same process would apply if a title act branch were eliminated in California but not in other states. When such an engineer applies for comity, the application is evaluated by one of the Board's three senior engineering registrars to determine which California-recognized branch provides the best fit. The evaluation considers education, experience, and examination.

Aeronautical engineering is an example of such a branch. Aeronautical engineers in other states must take and pass the NCEES aeronautical engineering examination. The test is not administered in California because California does not register the branch. When an engineer registered as an aeronautical engineer in another state applies here for registration by comity, the engineering registrar looks for graduation with an engineering degree in an ABET[*]- accredited curriculum. With that degree and two years of experience under the supervision of a mechanical engineer, an aeronautical engineer would be allowed to substitute passage of the NCEES aeronautical engineering examination as the equivalent of passage of the NCEES mechanical engineering examination.

The Board recommends that, for the present, the 10 title acts remain in place. The Board is considering the possibility of eventual elimination of the title acts, either through actual elimination of the title or through conversion to practice acts. There has been discussion at the NCEES of eliminating examinations for some of the title-act disciplines. Should that happen, we would consider introducing legislation to allow the Board to discontinue administering other title-act examinations (and therefore discontinue issuing new registrations) if there is no national examination in that branch. This would relieve the Board of the expense of developing new examinations or of continuing to regulate a branch of engineering no longer tested or regulated elsewhere in the United States.

[*] Accreditation Board for Engineering Technology

ISSUE #3. Should <u>all</u> engineers be allowed to perform "supplemental work" in other engineering disciplines, as long as they are competent to perform in these areas based on their education, training and experience?

<u>Recommendation</u>: ***The Board should define and justify its definition of "supplemental work," but it should first discuss the concept of "supplemental work" along with any review regarding licensure and "title acts," as previously recommended.***

<u>Board Response</u>:

Currently, civil engineers are the only registrants who can perform work in any of the other branches of professional engineering. Business and Professions Code 6737.2 allows supplemental work by a civil engineer as long as the work is incidental to or in conjunction with civil engineering work or study. For many years, civil engineers have provided and continue to provide sound engineering work in other branches as evidenced by the lack of enforcement cases filed against a civil engineer involving supplemental work.

The Board supports the concept of civil, mechanical and electrical engineers performing work that is incidental to work in their own discipline in the other engineering disciplines, as long as they are competent in these areas based on education, training, and experience. This would reduce the number of gray areas between the practice of similar or related engineering disciplines.

However, if the supplemental work concept were extended to any of the title act branches of engineering, protection for California's consumers would suffer. If a title act engineer is found to be incompetent, the strongest disciplinary action available to the Board is to revoke that engineer's registration. Revocation only prohibits the use of the title. It is still legal for the person to perform the same engineering work. If public safety is an issue, only the practice acts allow a range of disciplinary actions that can offer consumer protection.

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What Other States are Doing

During the summer of 1998, the Board sent a 15-question survey to all the other states and territories in preparation for the 1998 sunset hearings. Approximately one-third of the states did not reply because of the press of other business.

With regard to supplemental work, the states with generic registration allow overlap between the branches. However, eight of the eleven states which register

according to discipline indicated they also allow overlap between branches if the engineer is competent and if the work is incidental.

Of interest is the fact that the authority to overlap into civil engineering is not as widespread. Only five of the states which register according to discipline allow overlap into civil engineering, whereas six states which register according to discipline specifically prohibit overlap into civil engineering, even if the work is incidental.

Responses to other questions indicate that California's unique licensing program was confusing to some respondents. For example, one of the questions was: "*Does your state have any title act registrations? ('Title act registration' means that any one can* ***perform*** *the engineering tasks, but only those who have taken and passed the exam and are registered by the Board* ***can use the title****.)*" Fourteen states responded that they register title acts. However, follow-up phone calls confirmed that the states did not understand the fundamental differences in California's unique "title act" provisions. California remains the only state with title act registrations.

Further, despite the care taken to write other questions and provide explanations about California's licensing program in simple terms, many questions were answered, "I don't understand the question." We believe this is because of the complicated manner in which California registers engineers.

SB 2069/Knight (1998 Legislative Session)

In 1998, Sen. Knight introduced Senate Bill 2069; the bill was sponsored by the California Legislative Council of Professional Engineers (CLCPE). While the Board opposed the bill for a variety of reasons, the Board could not assist in drafting proposed amendments since CLCPE was not able to identify the perceived problem which it was trying to solve with the bill.

The first area of concern with SB 2069 was the proposed addition of Section 6730.3 to the Professional Engineers Act. The language would have allowed for overlap by **any** engineer — regardless of the branch or title in which he/she was examined — into the branches of civil, electrical, or mechanical engineering if competent and proficient as determined by education or experience. However, those engineers would only have been permitted to use the title of the branch in which they were registered. In other words, an engineer whom we register only by title would be able to practice civil, electrical, or mechanical engineering without ever having demonstrated or having been examined for competence in that area.

It also appears that this bill could be considered an attempt to end-run the requirement that civil engineers take the California-specific Seismic Principles and Engineering Surveying examinations. In 1985, the legislature, through a bill authored by the Chair of the Senate Business and Professions Committee (Chapter 1134, Stats. of 1985), directed the Board to examine all civil engineering applicants in the areas of seismic principles and engineering surveying. SB 2069 would have allowed engineers in all branches to practice civil engineering without having demonstrated their competence through examination in either seismic principles or engineering surveying.

Furthermore, while SB 2069 seemed to make just one change by allowing for overlap between the branches of engineering, in reality the bill either created up to 15 new practice acts of engineering **or** totally deregulated all branches of engineering.

Following meetings with the sponsor of the bill, it was very unclear to the Board what they were attempting to achieve with this bill. The sponsor seemed to be striving to regulate the entire scope of engineering via generic registration, but the format that was pursued in SB 2069 was not generic registration. Generic registration allows for the regulation of the practice of each branch of engineering; it does **not** regulate the practice of some branches and the title of other branches.

Moreover, under the most literal reading, the bill would have deregulated the entire practice of engineering by allowing only for title act registration, thereby leaving regulation up to local agencies — the state's individual cities and counties. The Board strongly advocated the position that having 58 sets of rules among California's counties, and hundreds of other sets of rules among the cities, would hold engineers in different areas of the state to greatly-varying standards. The Board's statutory mandate is to protect the public health, safety and welfare. SB 2069 would have eliminated all avenues of consumer protection.

Lastly, SB 2069 failed to recognize the distinction between practice acts and title acts and did not acknowledge the title authorities of structural engineering and geotechnical engineering. Under current law, for example, the Health and Safety Code and the Education Code, respectively, require that any person designing a hospital or a public school must be a registered Structural Engineer. As drafted, SB 2069 compromised public safety by attempting to override the Legislature's directive that hospitals and public schools be designed only by those who have passed the comprehensive structural engineering examination.

Respectfully, it was and still is the Board's opinion that the addition of one section of law, as proposed in SB 2069, would not accomplish the sponsor's objective by overriding all other conflicting sections. The Board supports generic registration, but not in the pure form. Instead, the Board supports quasi-generic registration,

where the branch(es) of engineering in which an engineer has been examined is identified and publicized. The **practice** of each branch of engineering would be regulated but some overlap between branches (as determined by education, examination, and experience) would be allowed.

Registration of Doctors and Attorneys as Compared to Professional Engineering Registration . . . and SB 2069

One of the fundamental flaws in the thought process represented in SB 2069 is the presumption that all engineers (regardless of their "branches") will be legally authorized to practice in whatever branch of engineering they so desire. This strongly conflicts with the only justification for having a Professional Engineers Act; i.e. public health, safety, and welfare.

It is often said that medical doctors get by with only "one license" in California, irrespective of their intended specialty, and that they gain their specialty license by "certificates" that come later from sources other than the Medical Board of California. The same is said for attorneys, i.e.; once licensed, they can practice any part of the law which they choose. To a great extent, this is true. It is also often suggested that what is good enough for doctors and lawyers ought to be good enough for engineers.

However, just as true are the following statements:

- Medical Doctors all start out with a medical degree that is fundamentally the same, no matter which school they attend. Likewise, almost all lawyers complete the same American Bar Association-stipulated legal education.

- Virtually all medical doctors in California take the one/same medical examinations prior to starting their practices. All lawyers in California take the same bar exam prior to entering practice.

- Conversely, there are dozens of different kinds of engineering degrees. The curricula for a chemical engineer versus that of a civil engineer or an electrical engineer are so vastly different that more than 50 percent of their classes/curricula are not recognizably similar.

- Perhaps more importantly, and this is true throughout the entire United States, there is no common licensing examination that is taken by all branches of engineering. In other words, unlike doctors and lawyers, a civil engineer takes a different test than does an electrical or mechanical or nuclear engineer.

- Engineers in different branches perform very different work; in many instances, so different that they are really different professions. It would be hard to imagine an electrical engineer or nuclear engineer or fire protection engineer being able to competently practice civil engineering without receiving additional substantial formal education in civil engineering.

In summary, the Board would like to reiterate its support for the concept of quasi-generic registration, where the branch(es) of engineering in which an engineer has been examined is identified and publicized. The **practice** of each branch of engineering would be regulated but some overlap between branches (as determined by education, examination, and experience) would be allowed.

ISSUE #4. Should the Board of Professional Engineers and Land Surveyors be continued as an independent board, or should its operation and functions be assumed by the Department of Consumer Affairs?

Recommendation: ***An independent Board of Professional Engineers and Land Surveyors should be continued. However, the sunset date for this Board should only be extended for two years, to July 1, 2000, because of major unresolved issues dealing with the regulatory authority of this Board. The review of this Board should only be limited to those unresolved issues as identified by the Joint Committee.***

Board Response:

This Board, consisting of practicing engineers and land surveyors and public members, should continue to regulate the practices of professional engineering and land surveying in California.

Public members represent the interests of consumers and provide a balance between consumer interests in public protection and the interests of the professions of engineering and land surveying.

Board members who are registered to practice engineering and land surveying help the public members and staff stay current with and understand innovations in engineering and land surveying. Professional members knowledgeable about structures, soil erosion, bridge and highway design, and mechanical and electrical issues help protect California citizens by providing sound, practical, and immediate advice during periods of disaster, when reviewing enforcement matters, and when making policy decisions.

Both engineering and land surveying are highly technical, and the professional members of the Board bring a level of knowledge that would be unavailable in a bureau setting.

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ISSUE #5. Should the composition of the Board be changed?

Recommendation: ***The total membership of the Board should not be changed, but the Board should be structured so as to adequately reflect the licensing population of engineers in the private and public sector.***

Board Response:

The Board agrees with the DCA recommendation. Existing law authorizes the Governor to appoint registrants/licensees and public members and the Senate Pro Tempore and the Assembly Speaker to each appoint one public member to the Board.

The people who have been and currently are members of the Board come from diverse backgrounds. James W. Foley, Jr., P. E., appointed to the Board in October, 1998, has worked for the City of San Jose since 1980 and is currently department manager of the design and construction division for the Department of Public Works. He has acted as the city engineer for the City of Campbell. Foley was appointed as one of the Board's six registered/licensed members.

The Board has previously had both public and professional members who were government employees. Among others, Joel B. Klein, an electrical engineer employed by the California Energy Commission, served as a Board member from 1977 to 1986. Sharon Jasek Reid, an employee of San Diego County Department of Public Works, served as a public member of the Board from 1983 to 1995. Technical Advisory Committee (TAC) members are engineers and land surveyors in both the public and private sector who are appointed by the Board. Public-sector and private-sector employees are hired as Subject Matter Experts to develop examinations and as Technical Experts to review enforcement cases.

The following chart summarizes the membership status and background of the current board members.

Position	Appointed	Term Expires	Status	Current Member, Background/Expertise
Civil Engr.	Feb. 1992	June 1999	P.E.	Ted C. Fairfield, P. E. — Civil Engineer: Sole Proprietor, Consulting Engineering Firm
Structural	Oct. 1998	June 2000	P.E.	Gregg Brandow, P. E. — Structural Engineer: President, Structural Engineering Firm; Adjunct Professor of Engr., Univ. of Southern Calif.
Electrical Engineer	Oct. 1996	June 2001	P.E.	Vincent Di Tomaso, P. E. — Electrical Engineer, Retired

Mechanical Engineer	June 1993	June 2000	P.E.	Quang D. Vu, P. E. — Mechanical Engineer; Majority Owner, Electrical & Mechanical Engr. Consulting Firm
Other Branch of Professional Engineering	Oct. 1998	June 2002	P.E.	James W. Foley, Jr., P. E. — Geotechnical Engineer; Mgr. of Design & Construction Div., Dept. of Public Works, City of San Jose
Land Surveyor	Nov. 1995	June 1999	P.L.S.	George Shambeck, P. L. S. — Land Surveyor; President, Civil Engineering and Land Surveying firm
Public # 1	Oct. 1996	June 2000	Public	Marilyn Lyon — Local Elected Official
Public # 2	Feb. 1993	June 2002	Public	Stephen H. Lazarian, Jr. — Licensed Contractor; Attorney
Public # 3	July 1995*	June 1999	Public	Millicent Safran — Legal Secretary/Community Volunteer
Public # 4	Dec. 1996*	June 1999	Public	Andrew J. Hopwood — Petroleum Industry
Public # 5	June 1993	June 2000	Public	Myrna B. Powell — Consumer Advocate
Public # 6	March 1994	June 2002	Public	Kathryn Hoffman — Information Technology Manager
Public # 7	Oct. 1998	June 2002	Public	David Chen, L.Ac., O.M.D. — Licensed Acupuncturist

* All professional members and five of the seven public members are appointed by the Governor. Public member # 3 was appointed by the Senate Rules Committee; public member #4 was appointed by the Assembly Speaker.

ISSUE #6. Should the exemption from licensure for employees of industry be expanded for engineers who either contract with, or provide consulting services for, exempt industries?

Recommendation: ***The Joint Committee supports an expansion of the exemption. It should be expanded to include not only direct employees and consultants, but also temporary employees, contract employees, and those hired through third-party contracts.***

Board Response:

In November 1996, during hearings before the JLSRC, the Board suggested that the industrial exemption be expanded to include individuals, such as independent contractors, working for industry. Senator Greene, as chair of the JLSRC, sponsored legislation (SB 828/1996) to extend the Board's sunset date by two years and at that time worked closely with DCA to include an expansion to the industrial exemption in his bill.

Unfortunately, the Board was not consulted about the language placed in the bill, and we believe the exemption is too broad. The language in the bill expanded the industrial exemption to include “consultants, temporary employees, contract employees, and those persons hired pursuant to third party contracts.” The Board is concerned with how "third party contracts" will be interpreted. The potential harm would be unlicensed persons using the industrial exemption to get around the licensing laws for work not being done for the industrial corporation.

The Board voiced strong concerns about the language, as did professional organizations, but influential support from the software and electronics industries defeated efforts to address those concerns.

The software and electronic industries have committed to work with us to draft language that clarifies the situation to everyone's satisfaction. We are still in the working stages. There is no guarantee that we will agree upon specific language, but all sides are willing to work on a compromise.

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ISSUE #7. Should the requirements to take the Engineer-In-Training examination be changed or eliminated?

Recommendation: ***The Joint Committee would like further justification for requiring this exam. The benefits of this exam are unclear, as is the necessity of the state mandate. Suggest possibly making the exam advisory for students and potential employers, and no longer a prerequisite for licensure. Would include this issue as part of the review regarding licensure, as previously recommended.***

Board Response:

The Fundamentals of Engineering (FE)/ Engineer-in-Training (EIT) examination is developed and scored by the National Council of Examiners in Engineering and Surveying (NCEES). The comprehensive eight-hour exam tests fundamental engineering knowledge in circuits, fluid mechanics, thermodynamics, solid mechanics, mechanics/statics, materials science, mathematics and chemistry. The four-hour multiple choice morning section covers the fundamentals including mathematics and the basic sciences. The multiple choice questions in the afternoon session are written to assess depth of knowledge in a selected subject area. Whichever subject area is chosen is strictly for the purpose of the examination and has no influence as to the area of licensed professional practice pursued. It is administered in all states and territories on the same day, twice a year.

In order to take the EIT exam an applicant must have

- completed at least three years of college work in a Board-approved engineering curriculum

or

- have had at least three years of engineering-related work experience

and

- not have been convicted of a crime substantially related to the practice of engineering or land surveying.

Most students take the FE/EIT examination late in their senior year.

Taking and passing the EIT confers two benefits to California candidates. First, because passing the EIT demonstrates a fundamental knowledge in the area of engineering, EIT certification drastically reduces the number of years of work experience or on-the-job training required before a candidate can sit for the professional engineering exam. Also, many employers prefer to hire people who have passed the EIT, as it measures knowledge of the fundamentals of engineering. Board staff receives many requests for verification of EIT certification from

potential employers. The requirements for taking a California professional engineering examination with and without an EIT certificate are set out below:

With an EIT Certificate:

1. An ABET*-accredited BS degree and two years of work experience,
or 2. a non-ABET*-accredited BS degree and four years of work experience
or 3. an ABET*-accredited BS and MS or Ph.D. degree from an ABET-accredited program and one year of work experience
or 4. six years work experience

Without an EIT Certificate:

1. a non-ABET*-accredited BS degree and 17 years of work experience,
or 2. an ABET*-accredited BS degree and 15 years of work experience
or 3. an ABET*-accredited BS degree, an MS degree from an ABET-accredited program, and 14 years of experience
or 4. an ABET*-accredited BS degree, a Ph.D. degree from an ABET-accredited program, and six years of experience (effective until 2/2000).

* ABET: Accreditation Board for Engineering Technology

The second benefit of EIT certification is that 24 state boards require passage of the eight-hour EIT exam and the eight-hour principles and practice exam for comity registration. Those 24 boards will not waive the EIT requirement. Without the EIT exams, no California-licensed professional engineer could be registered through comity in those jurisdictions.

For the above reasons, we do not recommend that the requirements for the Engineer-In-Training examination (EIT) be changed or eliminated.

ISSUE #8. Should a separate California "Seismic Principles" examination be required for <u>all</u> engineering disciplines, or should it be combined with national examinations for specified engineering disciplines?

<u>Recommendation</u>: ***The current "Seismic Principles" examination, required for civil engineers, should be reviewed to assure that it is only testing for those seismic design principles which are critical to practice in California and to determine if other disciplines identified by the Seismic Safety Commission should be examined. There should also be consideration made to combining this exam with the national exam.***

<u>Board Response</u>:

In its 1995 Report on the Northridge Earthquake, the Seismic Safety Commission (SSC) made recommendations on seismic safety planning for California, including the recommendation that the governor direct that California's codes and regulations be amended to improve the way the licensing boards, including the Contractors State Licensing Board, the Board of Architectural Examiners, and the Board of Registration for Engineers and Land Surveyors, test their licensees on seismic principles.

We have been responding to the SSC request. The seismic principles test plan was updated in 1996 to include the SSC recommendations. While all of California's engineering and land surveying test plans are regularly updated to reflect changes in practice, knowledge, new methodologies, and new laws; this update paid special attention to the SSC report and the lessons learned from the Northridge earthquake.

There is no national seismic safety examination. Because California is a seismically active state, it is important for the protection of the public that California engineers are at least minimally competent in seismic design principles.

Examinations are intended to prevent anyone who does not meet minimum standards from practicing professions in which the consequences of incompetency have public safety repercussions. Besides protecting public safety directly by screening out engineers who are not minimally competent, increased seismic testing requirements have the additional benefit to California consumers of encouraging potential engineers to study seismic principles and encouraging engineering schools to continue their research and to teach the most recent information to their students.

Following the SSC Northridge report, the Board asked the Electrical Engineering Technical Advisory Committee (EE TAC) and the Mechanical Engineering Technical Advisory Committee (ME TAC) to discuss the addition of seismic issues to the mechanical and electrical engineering examinations. While the TAC members think such examinations would be valuable, and the Board, as stated in Issue #1, recommends extension of the examinations to mechanical and electrical engineers, funding must be authorized by the legislature before examinations can be developed. In order to educate the current population of electrical and mechanical engineers, members of the Technical Advisory Committees have decided to prepare a series of articles for the Board's newsletter about potential seismic issues and how to avoid equipment failure or destruction of equipment during an earthquake.

ISSUE #9. Should the "Engineering Surveying" examination required for civil engineering candidates be changed or eliminated?

Recommendation: ***Further justification for requiring this examination is necessary. The benefits of this exam are unclear, as is the necessity of the state mandate. Recommend that include this issue as part of the review regarding licensure, as previously recommended.***

Board Response:

To ensure the proper design and layout of civil engineering fixed works, a civil engineer may perform topographic and construction layout surveys. Most civil engineering plans include both topographical information and construction design layout tasks. In addition, the practice of civil engineering includes grading, which involves setting elevations.

The legislation requiring civil engineers to be examined in engineering surveying was adopted in 1985 as a compromise between civil engineering and land surveying professionals. Prior to 1982, all civil engineers were authorized to practice all aspects of land surveying. Land surveying professionals argued that civil engineers are not educated or examined in all aspects of land surveying and therefore have not demonstrated competency in the profession.

The California Engineering Surveying examination is based upon occupational analyses, which are used to develop a test plan that will evaluate whether or not a civil engineer is technically competent to perform the surveying work required by civil engineering design tasks. Since all civil engineers are able to practice in an area that may include topographic surveys, construction design layout, or grading, it is appropriate that they show proficiency in that area. The engineering survey exam is designed to demonstrate that proficiency.

The JLSRC commented that the passage rate for the engineering surveying exam has varied substantially from one year to the next and suggested this indicates inconsistency in scoring the examination. Passage rates of the examinations fluctuate from year to year because both the examination questions and the population being examined are different each year. While the questions are equivalent, it is not always possible for each item to be equally difficult. The difference in the cut score takes this into account. Grading methods are consistent from year to year. The examinations are rewritten for exam security reasons and, when necessary, to include new information. Exams are developed by an outside vendor, not the Department's Office of Examination Resources.

We recommend that civil engineers continue to be examined in engineering surveying.

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ISSUE #10. Should the Board eliminate the current California examination for "Structural" (Civil) Engineers and instead utilize the national examination?

Recommendation: ***Further justification for requiring a California examination for structural engineers, rather than utilizing the national examination, is necessary. Recommend that the Board include this issue as part of the review regarding licensure, as previously recommended.***

Board Response:

In response to the JLSRC questions and comments about the California structural engineering exam, the Board appointed a subcommittee to evaluate possible use of the current NCEES Structural Engineering examinations in conjunction with a modified California-specific structural engineering exam. The subcommittee assessed the California structural engineering examination and the NCEES structural engineering examinations. It also considered improvements to the NCEES exam that would be necessary for California to use it, with the addition of California-specific seismic questions for the areas relating to hospitals and public schools, for licensing purposes.

The subcommittee held three meetings where speakers from various professional societies and NCEES made presentations. The subcommittee focused on the 16-hour California Structural Engineering Examination and the NCEES Structural I and II Examinations. The review and evaluation found:

- The NCEES Structural I exam is an entry level exam, not suitable for licensing purposes.

- The California structural exam is a mastery-level exam. Candidates must have three years of experience as a registered civil engineer.

- The quality of the NCEES exams is not as high as the California exams. NCEES test items are not developed under controlled conditions in a secured location with a test-development specialist, while California test item development meets those criteria.

- The California structural exam is specifically tailored for the state's seismic conditions.

- The passage rate is higher for the California exam. The average pass rate over the past five years for the California exam is 24%. Over the same five-year period, the average pass rate for the NCEES Structural I (entry-level) was 25% and for the Structural II, 22%.

- It is more cost effective for candidates to take the California exam. Candidates must pay $175 to take California's exam. Candidates pay $85 to take the NCEES Structural I and $145 to take the NCEES Structural II for a total of $230. The candidate cost for the NCEES Structural II exam will increase to $295 in 1999, for a total of $380.

Other fundamental differences between the California and NCEES exams are summarized in the following tables.

The subcommittee recommended continued use of the California Structural Engineering Examination, using the 1998 development process and annual evaluation. The California exam best addresses the state's special seismic requirements and is compliant with Title 24 (California Building Code) and the state's health and safety codes.

Further, the subcommittee recommended that the Board's structural engineering member monitor and participate with NCEES in exam development and encourage other California structural engineers to participate. NCEES is changing its examination development process. We hope that during the transition, we can coordinate with NCEES to develop an acceptable structural engineering exam. NCEES has acknowledged that existing and future exams must require more knowledge-based and higher cognitive-level questions to meet the requirements of states using the exams for licensure and registration purposes.

CA STRUCTURAL EXAM	**NCEES STRUCTURAL II EXAM**
New test plan adopted in July 1997	Test plan completed in 1980, updated in 87, 88, 89.
16 hour examination	8 hour examination
The exam development committee composition reflects California's population of structural engineers in practice, age, sex, ethnicity, etc. Item writers meet with exam specialists for calibration and training. Questions developed in a controlled environment; items written and linked to test plan specifications.	Volunteers are recruited from participating states and serve for many years. Item writers receive a matrix and manual developed for them in the mail. Items writers are assigned a subject and questions are developed at item writer's location, then mailed to NCEES.
Office of Examination Resources optically scans answer sheets, does item analysis, produces final scores. Statistical analysis of item quality.	NCEES scans the answer sheets and produces final scores.

Criterion-based grading and standard setting.	Pass/Fail grading.
Many data points collected to ascertain candidate's competency.	Very few elements or data points collected to ascertain candidates' competency.
Multiple-choice items together with essay items. Each essay item has separate elements to be evaluated (method, answer, reference, etc.)	One problem in the A.M., one problem in the P.M.
Many opportunities for candidate to demonstrate minimum competency.	One opportunity to pass or fail, candidates can make one fatal error and fail exam.
Superior graphics content and more notations.	Passable, elementary, or inadequate graphics.
Problem complexity high, requires high level of knowledge of engineering concepts to solve problems.	Problems have low level of complexity and there is limited testing of advanced engineering concepts.
Mastery level exam (candidates must have three years experience as registered civil engineer)	Entry level applicants may take the exam.
Covers Title 24, California Building Code (Uniform Building Code) as well as amendments incorporated at recommendation of the State Architect and the Office of Statewide Health Planning and Design.	Does not cover Title 24 (California Building Code). Uses three codes: Uniform Building Code, National Building Code, and Standard Building Code.
Covers all four common building materials: steel, concrete, wood, and masonry.	Contains only two test questions and does not cover all four materials.
Covers school and hospital problems, no bridge problems, in accordance with the new examination test plan and California Building Code.	Contains bridge problems, but no school or hospital problems. Not compliant with California practice.

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ISSUE #11. Should the Board perform a task analysis on the California Professional Land Surveyors examination, and utilize the (national) NCEES Professional Land Surveyors examination, along with the California-specific examination, in order to provide land surveyors comity with other states?

Recommendation: ***The Board should utilize the NCEES examination for land surveyors and only use a California-specific examination which tests in those areas which are essential to practice in California.***

Board Response:

In mid-1997, in response to the comments of the JLSRC, the Board established a subcommittee on land surveyor exams to explore whether California should consider using the National Council of Examiners for Engineering and Surveying (NCEES) exam, continue to use our own exam, or use the NCEES exam in conjunction with the California exam.

The subcommittee held three meetings to study and evaluate the NCEES exam's suitability for California. It determined that the current NCEES exam does not adequately address California's needs for the following reasons:

- The NCEES examination is an entry-level exam similar to the land surveyor in training (LSIT) exam and is not suitable for licensing land surveyors in California.
- The current six-hour NCEES exam, based on a 1991 task analysis, is multiple-choice only and includes no essay type questions. There is no demonstration of analytical or communication skills in the NCEES examination.
- The current California exam, which consists of 30 to 40% multiple choice questions and 60 to 70% design (essay type) questions, is based on a 1995 task analysis. It is eight hours in length and tests all of the items required by statute and Board regulations.
- Test items for both NCEES and California are prepared under controlled conditions in a secured locale with test development specialists.
- The NCEES examination is prepared by an Examination for Professional Surveyors (EPS) committee. Only three representatives from California are involved. The preparation, grading, and standard setting for the California exam is done by independent committees ranging in size from eight to 60 professional land surveyors. This provides a sound and continuing check and balance system for the examination.

- Since NCEES cannot include state specific or jurisdictional questions, the exam is limited. State-specific and jurisdictional questions are required for public protection.

    1. California is a public lands state, but there are minimal, rudimentary public lands questions on the NCEES exam.

    2. California has extensive shore and sea boundaries in addition to numerous lakes and rivers boundaries, but there are no California-specific water boundary questions on the NCEES exam.

    3. California has one of the most extensive Subdivision Map Acts of any state, but there are no questions about the Subdivision Map Act on the NCEES exam.

    4. California is subject to extensive earth movements, but the NCEES exam contains no questions relating to the California Coordinate System.

- There is little difference in cost to candidates. The cost to take the NCEES examination has been raised from $99 to $150. The cost of California's land surveying exam is $175.

Therefore, based on the above observations, the Board does not mandate that California candidates take both the 8-hour national exam and an additional state-specific exam. Whereas PLS candidates in other states must take the national exam **and** a state-specific exam, the Board requires that California candidates **only** take the state-specific exam. Taking just one exam is more economical for California candidates and still provides the required safeguards to protect California consumers.

NCEES completed a national task analysis in 1997. The task analysis was reviewed and approved by NCEES in August 1998. This new task analysis will be the basis of the October 1999 NCEES exam. It may be possible to utilize the rewritten NCEES multiple-choice examination to replace California's multiple-choice portion of the exam with the addition of a four to six-hour portion of California-prepared design problems to satisfy state-specific needs.

Beginning in October of 1998, NCEES will begin writing its land surveyor-in-training exam on an academic basis. Questions included will be based more on the kinds of technical/scientific instruction obtained in college-level courses. The knowledge base and cognitive value of the principles and practices exam (the professional exam) will also be raised as a result of this change in level on the land-surveyor-in-training exam.

The subcommittee recommended continued monitoring of the NCEES exam to determine when it is acceptable for California. Passage of the NCEES exam would make it easier for a California-registered land surveyor to get comity with many other states, although some states would require passage of a state-specific exam. For example, Texas uses the eight-hour Land Surveyor-in- Training (LSIT) exam but not the NCEES LS exam; Texas, like California, has its own eight-hour exam. The Board is considering the subcommittee's recommendation that California offer to proctor the NCEES exam for applicants in California who are interested in comity with other states. There would be an additional cost for those applicants. The Board will continue to work with NCEES to improve that exam so it can be considered for future use in California.

Any recommendation on the time needed before a new state-specific exam portion can be adopted for use with the NCEES multiple-choice questions depends on how soon NCEES implements its proposals.

State Specific Exams in Other States

As is mentioned above, most of the other 49 states and territories require their PLS candidates to take a multi-hour state-specific exam in addition to, or instead of, the 8-hour national exam. (Some of the state-specific exams are as short as two hours, and some are as lengthy as another full 8-hour exam.)

California's PLS exam is a state-specific exam; however, it is the only exam required of California candidates. While this causes a problem with comity, it alleviates for California candidates some of the expense of having to take more than one test.

During the last 10 years, the California PLS pass rates have varied greatly. Since 1988, the pass rates has been: 41%, 44%, 30%, 26%, 25%, 15%, 16.9%, 8%, 15%, 23.2%, and 1.9%.

While the board was greatly dismayed at the 8% pass rate in 1995, the Board was tremendously alarmed at the 1.9% pass rate for the April 1998 exam. (This issue is further addressed below.)

The Board conducted a brief survey of the other states and territories, and has received a response from about half of the states. The survey asked for the "…recent pass rate for your State Specific PLS exam which the candidates must take in addition to the NCEES national PLS exam" from 1993 through 1998.

From some of the neighboring states, we have received the following figures [if more than one figure is given per year, then the PLS state specific exam is offered in April and October]:

Percentage of applicants passing PLS state-specific exam each year.

State	1993	1994	1995	1996	1997	1998
Washington	31	16.1	32	29	31	26
Nevada	51	50	70	51	55	56
Hawaii	38	13	18	42	48	21

Great fluctuations in the pass rates for state-specific exams is shown by the following states:

Percentage of applicants passing PLS state-specific exam each year.

State	1993	1994	1995	1996	1997	1998
South Carolina	44 / 36	60 / 38	46 / 51	21 / 53	30 / 17	50 /
Kansas	100	25	13	24	30	65

From some of the larger states, we have received the following pass rates for their PLS state specific exams:

Percentage of applicants passing PLS state-specific exam each year.

State	1993	1994	1995	1996	1997	1998
New York	27 / 28	27 / 28	26 / 31	33 / 24	37 / 13	21 /
Louisiana	38	58	62	51	47	38

The Board recognizes that no other state has ever had a pass rate as low as 1.9%, and we wish that the overall pass rate for the last six years was higher. However, statistics show that California candidates, for whatever reason, perform below the national average on the Professional Engineering exams. It is feasible that the same may be true of Professional Land Surveying candidates. We are in the process of conducting an in-depth historical review of all PLS candidates who have taken the California PLS exam during the last five years. For example, we are looking into the education and number of years of experience which were completed by the candidates who sat for the exam.

The April 1998 Exam

The Board has some serious concerns regarding the April 1998 PLS exam. The Board notes the low level of the "cut score" and the corresponding low passing rate on this year's exam, together with the downward trend of both values over the past five years. The Board believes that this is due either to a serious flaw in the examination itself, serious deficiencies within the candidate pool, a significant change in the practice of land surveying in general, or a combination of these factors.

The exam team has reviewed the exam as a whole, and they compared the April 1998 exam to the exams from the previous two years. They found that all three exams were comparable in terms of test plan coverage, difficulty, and fairness. In addition, the exam was reviewed by the Board and a committee of professional land surveyors for the same characteristics.

The Department's Office of Exam Resources (OER) has not been involved with the Land Surveyor examination for a variety of reasons. Service provided by OER has not been consistent, depending upon the particular staff assigned. In the past, the Board cancelled an OER contract over delays caused when OER staff was required to consult with OER management before being able to make a decision, meetings held when participants were unprepared and/or had not completed appropriate research for a given examination, or failure on the part of OER staff to listen to subject matter experts and Board staff about examination requirements specific to land surveyors and/or engineers. For this reason, the Board chose to contract with private vendors for what has proven to be better, more responsive service.

The Board believes that the exam process, in terms of content, difficulty, and fairness is sound and completely defensible to the surveying community. Nevertheless, at its September 1998 meeting, the Board began to develop actions to address these outstanding issues. One of the first steps will be to coordinate focus-outreach meetings to the college students and professors (as well as candidates who are not enrolled in college) and outreach to the professional community, exam psychometricians, candidates from the April 1998 exam, and employers.

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ISSUE #12. Should the six year experience requirement for licensure be increased to eight years as recommended by the Board?

Recommendation: ***The Board must demonstrate how an increase in two years of experience will enhance consumer protection. Should include this issue as part of the review regarding licensure, as previously recommended.***

Board Response:

All of the other 49 states, and all of the U.S. territories, require eight years experience to be eligible to take a professional engineering examination. The eight year requirement is a national standard which California does not meet; we allow registration with only six years experience.

We still believe that the change from six years to eight years is necessary and reasonable. As engineering becomes more technologically demanding, schools have backed away from teaching some of the practice oriented issues, such as contracts and specifications, and ethics. Additionally, it appears that California pass rates are lower than pass rates in the other states; we are compiling a comparison of California results to national results.

The Board does not have the authority, by regulation, to address the issue of increasing the experience requirement; a statutory change would be required. Staff is currently gathering data to see why California examinees are performing poorly before the Board pursues such legislation. In the past, opposition to such an increase has come from Professional Engineers in California Government because state employee promotions are based on registration.

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ISSUE #13. Should there be a continuing education requirement for all engineers, prior to renewal of a license, as recommended by the Board?

Recommendation: ***Joint Committee believes that all proposals to implement continuing education requirements, as a prerequisite for licensure renewal, should demonstrate that the mandate will improve licensee competency and will have a measurable impact on consumer protection. Do not believe that the Board has provided sufficient justification for adopting a continuing education requirement for all engineers. No recommendation at this time.***

Board Response:

DCA staff and the JLSRC staff have indicated that continuing education is not working for those disciplines which require it. Therefore, the Board dropped this from the PE Rewrite legislation. We have found that continuing education is an effective means of rehabilitating practitioners disciplined for negligence or incompetence and will continue to use it in that capacity.

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ISSUE #14. Should there be a "retired status" for engineers and land surveyors as recommended by the Board?

Recommendation: ***There is no justification at this time for granting a retired status to engineers and land surveyors.***

Board Response:

Many professional engineers and land surveyors have asked how they can retire without simply failing to renew and allowing their licenses to be considered delinquent. The Board proposed regulatory language to allow a licensee to choose a retired/inactive status. The proposed language follows:

> Board Rule 466. Retired/Inactive Registration and License.
>
> (a) The Board hereby establishes an inactive category of licensure for professional engineers and professional land surveyors who are not actively engaged in the practice of their profession. An inactive registration or license issued pursuant to this section shall be designated as a "retired/inactive status" and the registration or license shall be labeled a "retired/inactive registration" or "retired/inactive license."
> (b) The holder of a retired/inactive registration or retired/inactive license pursuant to this section shall not engage in any activity for which an active professional engineer's registration or professional land surveyor's license is required.
> (c) A retired/inactive registration or retired/inactive license shall be renewed during the same time period in which an active registration or license is renewed.
> (d) The renewal fee for a registration or a license in a retired/inactive status shall be forty dollars ($40).
> (e) A registration or license in a retired/inactive status must be renewed within 30 days after its expiration. If the registration or license is not renewed within 30 days after its expiration, the registration or license shall be placed in a delinquent status subject to delinquent renewal procedures.
> (f) A retired/inactive registration or retired/inactive license shall be issued if the applicant meets the following requirements:
> (1) Submission of retired/inactive status application form 466 and fee.
> (2) The applicant is a professional engineer or professional land surveyor registered or licensed in California.
> (3) The applicant's current or most recent registration or license is not suspended, revoked or otherwise punitively restricted by the Board or subject to disciplinary action.
> (4) The applicant is not delinquent in the payment of the renewal fees for any registration issued under the Professional Engineers Act or any license issued under the Professional Land Surveyors Act. This requirement does not apply to applicants who are delinquent prior to December 31, 1998.
> (g) In order for the holder of a retired/inactive registration or retired/inactive license issued pursuant to this section to restore his or her registration or license to an active status the retired/inactive registrant or licensee shall complete and pass the appropriate examination(s) for the type of registration or license previously held in an active status, and shall pay the required registration or license renewal fee.

The Office of Administrative Law rejected the language for reasons including lack of fiscal data connecting the fee with the Board's actual cost to issue the retired/inactive license and inconsistency with the enabling statutes concerning reinstatement of a retired/inactive license. The Board has decided to model new

language after the Pharmacy Board's existing statutory language for retired pharmacists. That language follows:

> Business and Professions Code Section 4200.5.
>
> (a) The board shall issue, upon application and payment of the fee established by Section 4400, and upon receipt of the applicant's wall certificate, a retired license to a pharmacist who has been licensed by the board for 20 years or longer, and who holds a license that is current and capable of being renewed pursuant to Section 4401, that is not suspended, revoked, or otherwise disciplined, or subject to pending discipline, under this chapter.
> (b) The holder of a retired license issued pursuant to this section shall not engage in any activity for which an active pharmacist's license is required. A pharmacist holding a retired license shall be permitted to use the titles "retired pharmacist" or "pharmacist, retired."
> (c) The holder of a retired license shall not be required to renew that license.
> (d) In order for the holder of a retired license issued pursuant to this section to restore his or her license to active status, he or she shall pass the examination that is required for initial licensure with the board.

ISSUE #15. Should the Board be granted legislative authority to define in regulations a code of professional practice?

Recommendation: ***The Board should only be granted this new authority after language has been reviewed by the Joint Committee. Recommend that include this issue as part of the review regarding licensure, as previously recommended.***

Board Response:

Currently, the Board is not seeking the legislative authority which would enable it to adopt, by regulation, a Code of Professional Practice. Existing law authorizes disciplinary action for fraud, deceit, misrepresentation, negligence, incompetence, breach of contract, and aiding/abetting another to violate the law. The Board is currently discussing this issue due to recent indications from the Attorney General's Office that such authority would be beneficial.